

Serial Number: 10/021,723ACRF Processing Date: 11/13/02
Edited by: De
Verified by: De (STIC staff)

ENTERED

- ☐ Changed a file from non-ASCII to ASCII
- ☐ Changed the margins in cases where the sequence text was "wrapped" down to the next line
- ☐ Edited a format error in the Current Application Data section, specifically: _____
- ☐ Edited the Current Application Data section with the actual current number. The number inputted by the applicant was ☐ the prior application data; or ☐ other _____
- ☐ Added the mandatory heading and subheadings for "Current Application Data".
- ☐ Edited the "Number of Sequences" field. The applicant spelled out a number instead of using an integer.
- ☐ Changed the spelling of a mandatory field (the headings or subheadings), specifically: _____
- ☐ Corrected the SEQ ID NO when obviously incorrect. The sequence numbers that were edited were: _____
- ☐ Inserted or corrected a nucleic number at the end of a nucleic line. SEQ ID NO's edited: _____
- ☐ Corrected subheading placement. All responses must be on the same line as each subheading. If the applicant placed a response below the subheading, this was moved to its appropriate place.
- ☐ Inserted colons after headings/subheadings. Headings edited included: _____
- ☐ Deleted extra, invalid, headings used by an applicant, specifically: _____
- ☒ Deleted: ☒ non-ASCII "garbage" at the beginning/end of files; ☐ secretary initials/filename at end of file;
☐ page numbers throughout text; ☐ other invalid text, such as _____
- ☐ Inserted mandatory headings, specifically: _____
- ☐ Corrected an obvious error in the response, specifically: _____
- ☐ Edited identifiers where upper case is used but lower case is required, or vice versa.
- ☐ Corrected an error in the Number of Sequences field, specifically: _____
- ☐ A "Hard Page Break" code was inserted by the applicant. All occurrences had to be deleted.
- ☐ Deleted **ending** stop codon in amino acid sequences and adjusted the "(A)Length:" field accordingly (error due to a PatentIn bug). Sequences corrected: _____
- ☐ Other: _____

*Examiner: The above corrections must be communicated to the applicant in the first Office Action. DO NOT send a copy of this form.



OIPE

RAW SEQUENCE LISTING

DATE: 11/13/2002

P-6

PATENT APPLICATION: US/10/021,723A

TIME: 09:41:47

Input Set : A:\PTO.DC.txt

Output Set: N:\CRF4\11132002\J021723A.raw

```

4 <110> APPLICANT: Short, Jay
5      Mathur, Eric
6      Richardson, Toby
7      Robertson, Dan
8      Barton, Nelson
10 <120> TITLE OF INVENTION: Recombinant Phytases and Uses Thereof
12 <130> FILE REFERENCE: 112766.140 (DIV-016CIP)
14 <140> CURRENT APPLICATION NUMBER: US 10/021,723A
C--> 15 <141> CURRENT FILING DATE: 2002-10-23
17 <150> PRIOR APPLICATION NUMBER: US 60/255,090
18 <151> PRIOR FILING DATE: 2000-12-12
20 <160> NUMBER OF SEQ ID NOS: 74
22 <170> SOFTWARE: FastSEQ for Windows Version 4.0
24 <210> SEQ ID NO: 1
25 <211> LENGTH: 1325
26 <212> TYPE: DNA
27 <213> ORGANISM: Yersinia pestis
29 <220> FEATURE:
30 <221> NAME/KEY: misc_feature
31 <222> LOCATION: 470, 487, 491, 492, 522
32 <223> OTHER INFORMATION: n = A,T,C or G
34 <400> SEQUENCE: 1
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36 gctgctatta ctgcgccggt agccgccgag ccatcgggct atactttaga acgtgtgggt 120
37 attttgagtc gccatggtgt tcgctcgccg accaaacaaa cgcagcttat gaatgatgtt 180
38 acgccagata agtggccaca atggccggta aaagcggggt atttaacgcc acgtggtgcg 240
39 gagttggtca cattgatggg ggggttttat ggtgattact ttgcagcctt tggtttggtt 300
40 gcggcgggat gtccggcaga ggggggggta tatgcacagg cagatatcga tcaacgtacc 360
41 cgcttaaccg gacaggcatt tcttgatggg gtggctccgg ggtgtggttt gaccgtgcat 420
W--> 42 aatcaggccg atttgaaaaa gaccgatccc ctgttccatc cggtagagggn tggcgtgtgt 480
W--> 43 aagttanacg nngcacaaac agataaagcg attgaagaac anttgggcgg gccgttagat 540
44 acggtgagcc agcgcctacgc taaacctttt gccagatgg' gggacgtgct gaattttgcg 600
45 gcttctcctt attgcaaatac tttgcaacag caaggaaaaa cgtgtgattt tgccactttg 660
46 cggccaatga agttaacggt aataaagaag ggacaaaagt gacctcagt gggccactgg 720
47 cgttatcatc gacattgggt gaaatcttct tattacaaaa cgcacaagcc atgccagagg 780
48 ttgcctggca acggctaaaa ggggcggaga attgggtatc cttattgtca ttacataacg 840
49 cgcaatttaa ttaaatggca aaaacaccgt atatcgcccg tcataaaggg acgccattat 900
50 tacagcagat agatacggct ttaaccttcc aactggatgc tcaggggcaa aagctacca 960
51 tttcagccca aaaccgggtc ttgttcctcg gtgggcatga taccaatatt gccaatattg 1020
52 cgggtatgct gggagccgac tggcagctac ccgagcaacc tgataatact ccaccagggtg 1080
53 ggggattggt ttttgaacta tggcaaaatc cggataacca ccagcgctac gttgcgggtg 1140
54 agatgttcta ccaaacgatg gatcagttgc gtaatgccga aaaattggat ctgaaaaata 1200
55 acccagcggg tattatttcc gttgcagttg ctggttggtg aaataacggt gacgataagc 1260

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Input Set : A:\PTO.DC.txt

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56 ttgtcgagct tgatacatc caaaagaaag tggctaaggt aattgaacct gcctgccaca 1320
57 tctaa                                     1325
59 <210> SEQ ID NO: 2
61 <211> LENGTH: 441
62 <212> TYPE: PRT
63 <213> ORGANISM: Yersinia pestis
65 <220> FEATURE:
66 <221> NAME/KEY: VARIANT
67 <222> LOCATION: 157, 163, 164, 174
68 <223> OTHER INFORMATION: Xaa = Any Amino Acid
70 <400> SEQUENCE: 2
71 Met Ser Val Leu Glu Asn Arg Val Arg Leu Ser Gly Leu Val Leu Met
72 1 5 10 15
73 Leu Ser Gly Leu Ala Ala Ile Thr Ala Pro Val Ala Ala Glu Pro Ser
74 20 25 30
75 Gly Tyr Thr Leu Glu Arg Val Val Ile Leu Ser Arg His Gly Val Arg
76 35 40 45
77 Ser Pro Thr Lys Gln Thr Gln Leu Met Asn Asp Val Thr Pro Asp Lys
78 50 55 60
79 Trp Pro Gln Trp Pro Val Lys Ala Gly Tyr Leu Thr Pro Arg Gly Ala
80 65 70 75 80
81 Glu Leu Val Thr Leu Met Gly Gly Phe Tyr Gly Asp Tyr Phe Arg Ser
82 85 90 95
83 Leu Gly Leu Leu Ala Ala Gly Cys Pro Ala Glu Gly Gly Val Tyr Ala
84 100 105 110
85 Gln Ala Asp Ile Asp Gln Arg Thr Arg Leu Thr Gly Gln Ala Phe Leu
86 115 120 125
87 Asp Gly Val Ala Pro Gly Cys Gly Leu Thr Val His Asn Gln Ala Asp
88 130 135 140
W--> 89 Leu Lys Lys Thr Asp Pro Leu Phe His Pro Val Glu Xaa Gly Val Cys
90 145 150 155 160
W--> 91 Lys Leu Xaa Xaa Ala Gln Thr Asp Lys Ala Ile Glu Glu Xaa Leu Gly
92 165 170 175
93 Gly Pro Leu Asp Thr Val Ser Gln Arg Tyr Ala Lys Pro Phe Ala Gln
94 180 185 190
95 Met Gly Asp Val Leu Asn Phe Ala Ala Ser Pro Tyr Cys Lys Ser Leu
96 195 200 205
97 Gln Gln Gln Gly Lys Thr Cys Asp Phe Ala His Phe Ala Ala Asn Glu
98 210 215 220
99 Val Asn Val Asn Lys Glu Gly Thr Lys Val Thr Leu Ser Gly Pro Leu
100 225 230 235 240
101 Ala Leu Ser Ser Thr Leu Gly Glu Ile Phe Leu Leu Gln Asn Ala Gln
102 245 250 255
103 Ala Met Pro Glu Val Ala Trp Gln Arg Leu Lys Gly Ala Glu Asn Trp
104 260 265 270
105 Val Ser Leu Leu Ser Leu His Asn Ala Gln Phe Asn Leu Met Ala Lys
106 275 280 285
107 Thr Pro Tyr Ile Ala Arg His Lys Gly Thr Pro Leu Leu Gln Gln Ile
108 290 295 300

```

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Output Set: N:\CRF4\11132002\J021723A.raw

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109 Asp Thr Ala Leu Thr Leu Gln Leu Asp Ala Gln Gly Gln Lys Leu Pro
110 305                      310                      315                      320
111 Ile Ser Ala Gln Asn Arg Val Leu Phe Leu Gly Gly His Asp Thr Asn
112                      325                      330                      335
113 Ile Ala Asn Ile Ala Gly Met Leu Gly Ala Asp Trp Gln Leu Pro Glu
114                      340                      345                      350
115 Gln Pro Asp Asn Thr Pro Pro Gly Gly Gly Leu Val Phe Glu Leu Trp
116                      355                      360                      365
117 Gln Asn Pro Asp Asn His Gln Arg Tyr Val Ala Val Lys Met Phe Tyr
118                      370                      375                      380
120 Gln Thr Met Asp Gln Leu Arg Asn Ala Glu Lys Leu Asp Leu Lys Asn
121 385                      390                      395                      400
122 Asn Pro Ala Gly Ile Ile Ser Val Ala Val Ala Gly Cys Glu Asn Asn
123                      405                      410                      415
124 Gly Asp Asp Lys Leu Cys Glu Leu Asp Thr Phe Gln Lys Lys Val Ala
125                      420                      425                      430
126 Lys Val Ile Glu Pro Ala Cys His Ile
127                      435                      440
130 <210> SEQ ID NO: 3
131 <211> LENGTH: 1325
132 <212> TYPE: DNA
133 <213> ORGANISM: Yersinia pestis
135 <400> SEQUENCE: 3
136 atgtcagtat tagaaaatcg tgtacggcta tctgggctgg tattgatgct aagcggattg 60
137 gctgctatta ctgcgccggt agccgccgag ccatcgggct atactttaga acgtgtggtt 120
138 attttgagtc gccatggtgt tcgctcgccg accaaacaac gcagcttatg aatgatgtta 180
139 cgccagataa gtggccacaa tggccggtaa aagcggggta tttaacgcca cgtgggtcgg 240
140 agttggtcac attgatgggg gggttttatg gtgattactt tcgcagcctt ggtttggttag 300
141 cggcgggatg tccggcagag ggggggggat atgcacagge agatatcgat caacgtaccc 360
142 gcttaaccgg acaggcattt cttgatggtg tggctccggg gtgtggtttg accgtgcata 420
143 atcaggccga tttgaaaaag accgatcccc tgttccatcc ggtagagact ggcgtgtgta 480
144 agttagacaa cgcacaaaaca gataaagcga ttgaagaacg attgggcggg ccgtagata 540
145 cggtgagcca gcgctacgct aaaccttttg ccagatggg ggacgtgctg aattttgcgg 600
146 cttctcctta ttgcaaatct ttgcaacagc aaggaaaaac gtgtgatttt gcccactttg 660
147 cggccaatga agttaacggt aataaagaag ggacaaaagt gacctcagt gggccactgg 720
148 cgttatcatc gacattgggt gaaatcttct tattacaaa cgcacaagcc atgccagagg 780
149 ttgcctggca acggctaaaa ggggcggaga attgggtatc cttattgtca ttacataacg 840
150 cgcaatttaa tttaatggca aaaacaccgt atatcgcccg tcataaaggg acgccattat 900
151 tacagcagat agatacggct ttaacccttc aactggatgc tcaggggcaa aagctaccca 960
152 tttcagccca aaaccgggtc ttgttcctcg gtgggcatga taccaatatt gccaatattg 1020
153 cgggtatgct gggagccgac tggcagctac ccgagcaacc tgataatact ccaccagggt 1080
154 ggggattggt ttttgaacta tggcaaaatc cggataacca ccagcgctac gttgcgggtg 1140
155 agatgttcta ccaaacgatg gatcagttgc gtaatgccga aaaattggat ctgaaaaata 1200
156 accagcggg tattatttcc gttgcagttg ctggttggtg aaataacggt gacgataagc 1260
157 tttgcgagct tgatacatc caaaagaaag tggctaaggt aattgaacct gcctgccaca 1320
158 tctaa                      1325
160 <210> SEQ ID NO: 4
161 <211> LENGTH: 420
162 <212> TYPE: PRT

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RAW SEQUENCE LISTING

DATE: 11/13/2002

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Input Set : A:\PTO.DC.txt

Output Set: N:\CRF4\11132002\J021723A.raw

163 <213> ORGANISM: Yersinia pestis

165 <400> SEQUENCE: 4

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166 Met Ser Val Leu Glu Asn Arg Val Arg Leu Ser Gly Leu Val Leu Met
167 1 5 10 15
168 Leu Ser Gly Leu Ala Ala Ile Thr Ala Pro Val Ala Ala Glu Pro Ser
169 20 25 30
170 Gly Tyr Thr Leu Glu Arg Val Val Ile Leu Ser Arg His Gly Val Arg
171 35 40 45
172 Ser Pro Thr Lys Gln Thr Gln Leu Met Asn Asp Val Thr Pro Asp Lys
173 50 55 60
174 Trp Pro Gln Trp Pro Val Lys Ala Gly Tyr Leu Thr Pro Arg Gly Ala
175 65 70 75 80
176 Glu Leu Val Thr Leu Met Gly Gly Phe Tyr Gly Asp Tyr Phe Arg Ser
177 85 90 95
179 Leu Gly Leu Leu Ala Ala Gly Cys Pro Ala Glu Gly Gly Val Tyr Ala
180 100 105 110
181 Gln Ala Asp Ile Asp Gln Arg Thr Arg Leu Thr Gly Gln Ala Phe Leu
182 115 120 125
183 Asp Gly Val Ala Pro Gly Cys Gly Leu Thr Val His Asn Gln Ala Asp
184 130 135 140
185 Leu Lys Lys Thr Asp Pro Leu Phe His Pro Val Glu Thr Gly Val Cys
186 145 150 155 160
187 Lys Leu Asp Asn Ala Gln Thr Asp Lys Ala Ile Glu Glu Arg Leu Gly
188 165 170 175
189 Gly Pro Leu Asp Thr Val Ser Gln Arg Tyr Ala Lys Pro Phe Ala Gln
190 180 185 190
191 Met Gly Asp Val Leu Asn Phe Ala Ala Ser Pro Tyr Cys Lys Ser Leu
192 195 200 205
193 Gln Gln Gln Gly Lys Thr Cys Asp Phe Ala His Phe Ala Ala Asn Glu
194 210 215 220
195 Val Asn Val Asn Lys Glu Gly Thr Lys Val Thr Leu Ser Gly Pro Leu
196 225 230 235 240
197 Ala Leu Ser Ser Thr Leu Gly Glu Ile Phe Leu Leu Gln Asn Ala Gln
198 245 250 255
199 Ala Met Pro Glu Val Ala Trp Gln Arg Leu Lys Gly Ala Glu Asn Trp
200 260 265 270
201 Val Ser Leu Leu Ser Leu His Asn Ala Gln Phe Asn Leu Met Ala Lys
202 275 280 285
203 Thr Pro Tyr Ile Ala Arg His Lys Gly Thr Pro Leu Leu Gln Gln Ile
204 290 295 300
205 Asp Thr Ala Leu Thr Leu Gln Leu Asp Ala Gln Gly Gln Lys Leu Pro
206 305 310 315 320
207 Ile Ser Ala Gln Asn Arg Val Leu Phe Leu Gly Gly His Asp Thr Asn
208 325 330 335
209 Ile Ala Asn Ile Ala Gly Met Leu Gly Ala Asp Trp Gln Leu Pro Glu
210 340 345 350
211 Gln Pro Asp Asn Thr Pro Pro Gly Gly Gly Leu Val Phe Glu Leu Trp
212 355 360 365
213 Gln Asn Pro Asp Asn His Gln Arg Tyr Val Ala Val Lys Met Phe Tyr

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RAW SEQUENCE LISTING

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DATE: 11/13/2002

TIME: 09:41:47

Input Set : A:\PTO.DC.txt

Output Set: N:\CRF4\11132002\J021723A.raw

```

214      370      375      380
215 Gln Thr Met Asp Gln Leu Arg Asn Ala Glu Lys Leu Asp Leu Lys Asn
216 385      390      395      400
217 Asn Pro Ala Gly Ile Ile Ser Val Ala Val Ala Gly Cys Glu Asn Asn
218      405      410      415
219 Gly Asp Asp Lys
220      420
223 <210> SEQ ID NO: 5
224 <211> LENGTH: 1266
225 <212> TYPE: DNA
226 <213> ORGANISM: Artificial Sequence
228 <220> FEATURE:
229 <223> OTHER INFORMATION: 953-6 phytase sequence
231 <400> SEQUENCE: 5
232 atgatacgata aatttattcc acaagggaga gaggccgtga agcatagcct gcttttgtcc 60
233 gccgcgctgc tggcgggatg cgccgcgtcc gcgccggcg ccgacgcac gcctgccgcg 120
234 ccgggggtcgc taaagctcga aaaggtcgtg atgctgatgc gccacggcgt tcgcccgccca 180
235 accaaggcgg cgggtggtgcc gcccggttat tcggccgaaa catggcccga ctggccgggtc 240
236 gatttcggcc tgctgacgcc gcacggcgcg gcgggggtca agctgctcgg cgaaagcgac 300
238 cgctcactt tcggcggtcg cggcctattc ccggaagggt gtcccgccgc gggcacgac 360
239 gtctcaagg caagctacaa ggagcgcacg atcgcgaccg cgcagaactg ggccgcgggg 420
240 ttcatgccc gctgcacggc ggatgtcgcg catcccgccg gtccggacga tgacgcgac 480
241 ttcatgggc tcgacggcgg cccgcctcgt ttccgacggc agcgggcatt cgatgccgcg 540
242 ctgcccagg cgcccgagg cggtgtgacc gccgaaaccg cagcccatcg cggcgaactg 600
243 accttgctcg cgaaagtgt gaattgtgcg ctgcccgcct gcccgctgat cggcgagccg 660
244 agccgactgg tcgcgacgcc gcacgatcgc cccgatctcg aaggcccgct cgacgtcgg 720
245 tcgaccgcga gccagacgct ggtgctgga tatctggaag gcaagccgat ggccgaggtc 780
246 ggctggggcc gcgtaagcc cgccgagatc gagcagttgc tgcgctttca tccgctcaaa 840
247 ttccgctatt cgaatcgccc cggctatatc gccgcgcgcg ccgcggcgcc gatcgtgcgc 900
248 gaaatcggtt cggcgctcga cagcaacagc ccggcgcggc tgaccttgct cgccggggcac 960
249 gacacgaac tcgccgacct cggcggttc ttgcacctg actggcaggt gccgagctat 1020
250 cccgccgacg aggttcgcc cggcagcgcg ttgggggttc agctggtcag caacgcgaag 1080
251 ggcgaccgct atgtccgcgc cttctatcgc gcgcagacga tggaccagct ccgcaacctc 1140
252 gaaccgctgg ggtcgggtga cgcgctgtac cgcgctatc ttccattcc ggggtgcggc 1200
253 cattcggtcg aggcaaccgc gtgcagctgg agtgatttcg cccggctcgc cgcgccgcgc 1260
254 gggtaa
256 <210> SEQ ID NO: 6
257 <211> LENGTH: 421
258 <212> TYPE: PRT
259 <213> ORGANISM: Artificial Sequence
261 <220> FEATURE:
262 <223> OTHER INFORMATION: 953-6 phytase sequence
264 <400> SEQUENCE: 6
265 Met Ile Asp Lys Phe Ile Pro Gln Gly Arg Glu Ser Val Lys His Ser
266 1      5      10      15
267 Leu Leu Leu Ser Ala Ala Leu Leu Ala Gly Cys Ala Ala Ser Ala Pro
268      20      25      30
269 Gly Ala Asp Ala Ser Pro Ala Ala Pro Gly Ser Leu Lys Leu Glu Lys
270      35      40      45

```

RAW SEQUENCE LISTING ERROR SUMMARY
PATENT APPLICATION: US/10/021,723A

DATE: 11/13/2002
TIME: 09:41:48

Input Set : A:\PTO.DC.txt
Output Set: N:\CRF4\11132002\J021723A.raw

Please Note:

Use of n and/or Xaa have been detected in the Sequence Listing. Please review the Sequence Listing to ensure that a corresponding explanation is presented in the <220> to <223> fields of each sequence which presents at least one n or Xaa.

Seq#:1; N Pos. 470,487,491,492,522
Seq#:2; Xaa Pos. 157,163,164,174
Seq#:17; Xaa Pos. 6
Seq#:18; Xaa Pos. 3

VERIFICATION SUMMARY

PATENT APPLICATION: US/10/021,723A

DATE: 11/13/2002

TIME: 09:41:48

Input Set : A:\PTO.DC.txt

Output Set: N:\CRF4\11132002\J021723A.raw

L:15 M:271 C: Current Filing Date differs, Replaced Current Filing Date
L:42 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:1 after pos.:420
L:43 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:1 after pos.:480
L:89 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:2 after pos.:144
L:91 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:2 after pos.:160
L:876 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:17 after pos.:0
L:895 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:18 after pos.:0